

CLAIMS

What is claimed is:

1. A heat pump system comprising:
a fluid storage reservoir;
a heat pump having a heat exchanger;
at least one pump for pumping fluid from the fluid storage reservoir to the heat exchanger and back to the fluid storage reservoir, wherein the at least one pump pumps the fluid in a first direction when the heat pump is on and pumps the fluid in a second direction, opposite the first direction, when the heat pump is off.
2. The heat pump system of claim 1 wherein the fluid storage reservoir includes a hot section and a cold section, and wherein the at least one pump pumps the fluid from the cold section to the heat exchanger and from the heat exchanger to the hot section based upon the heat pump being on, and wherein the at least one pump pumps the fluid from the hot section to the heat exchanger and from the heat exchanger to the cold section based upon the heat pump being off.
3. The heat pump system of claim 2 wherein the fluid is water.
4. The heat pump system of claim 3 wherein the heat pump is located outdoors and the fluid storage reservoir is located indoors.
5. The heat pump system of claim 1 wherein the at least one pump is connected by fluid lines between the fluid storage reservoir and the heat pump.

6. A method for preventing freezing in a heat pump system including the steps of:

- a) flowing a fluid from a fluid reservoir to a heat exchanger and back to the fluid reservoir in a first direction when the heat pump is on; and
- b) flowing the fluid in a second direction, opposite the first direction, when the heat pump is off.

7. The method of claim 6 wherein the fluid storage reservoir includes a hot section and a cold section, wherein said step a) further includes the step of flowing the fluid from the cold section to the heat exchanger and from the heat exchanger to the hot section based upon the heat pump being on, and wherein said step b) further includes the step of flowing the fluid from the hot section to the heat exchanger and from the heat exchanger to the cold section based upon the heat pump being off.

8. The method of claim 7 wherein the fluid is water.

9. The method of claim 7 wherein the heat pump is located outdoors and the fluid storage reservoir is located indoors.

10. A heat pump system comprising:
a water storage reservoir including a hot section and a cold section;
a heat pump having a heat exchanger outdoors where it is subject to freezing temperatures; and
at least one pump for pumping water from the water reservoir to the heat exchanger and back to the water reservoir, wherein the at least one pump pumps the water from the cold section to the heat exchanger and from the heat exchanger to the hot section when the heat pump is on, and wherein the at least one pump pumps the water from the hot section to the heat exchanger and from the heat exchanger to the cold section when the heat pump is off.

11. The heat pump system of claim 10 wherein the at least one pump pumps the water in a first direction from the cold section to the heat exchanger and from the heat exchanger to the hot section, and wherein the at least one pump pumps the water in a second direction, opposite the first direction, from the hot section to the heat exchanger and from the heat exchanger to the cold section, and wherein the at least one pump switches between pumping water in the first direction and pumping water in the second direction based at least in part upon a temperature of the water.

12. The heat pump system of claim 11 wherein the at least one pump switches between the first direction and the second direction based at least in part upon whether the heat pump is on or off.